NetCDF-4: Combining the Strengths of NetCDF and HDF5

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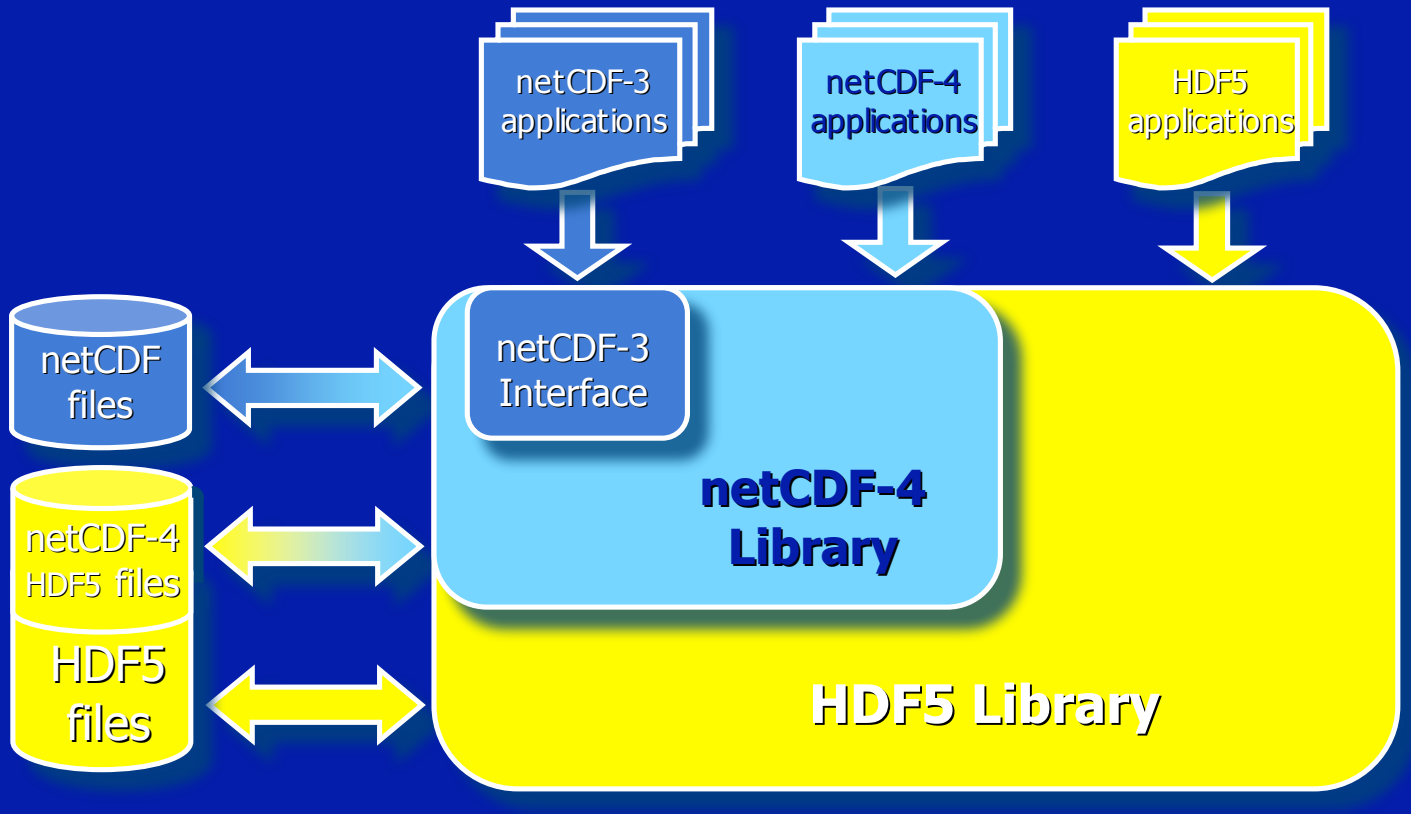
NetCDF-4/HDF5 Goals

- Combine desirable characteristics of netCDF and HDF5, while taking advantage of their separate strengths:
  - Widespread use and simplicity of netCDF
  - Generality and performance of HDF5
- Preserve format and API compatibility for netCDF users
- Single download: HDF5+NetCDF

NetCDF-4 Architecture



- Supports access to netCDF files and HDF5 files created through netCDF-4 interface

Key Features

- Compatibility with netCDF-3
- Easy to migrate programs to netCDF-4
- New features in netCDF-4 (enabled by HDF)
  - Large files
  - New data types
  - Parallel I/O (MPI-IO)
  - Multiple dynamic dimensions, storage options
  - Compression
  - Groups

Status

- HDF5-1.8.0 release: August 2005
  - Key features for netCDF-4
- netCDF-4 beta: Sept. 2005
  - Most features of netCDF4
  - Complete netCDF3 support
  - On top of HDF5-1.8

Institutional Support

- Joint Development
  - NetCDF-4: supported by Unidata
  - HDF5: NCSA, U. Illinois
- Distribution and support:
  - Source and binary available for free
  - Distributed and supported by Unidata and the HDF Group, Inc.
  - Details of packaging are TBD

Sidebar: THG

- New company: “The HDF Group, Inc. A Non-Profit Corporation” (aka, THG)
  - Not for profit
  - Mission oriented: develop and support HDF software
  - Most HDF work will migrate from NCSA to THG

HDF5 Standardization

- DOD Joint Technical Architecture "Emerging" standard for Application Specific Data Interchange
- ANSI: NCITS Fast Track
  - Working on proposal

User Communities

- netCDF
  - Widely used in Earth Sciences
- HDF5
  - Earth Observation/Remote Sensing
    - NASA EOSDIS
    - NPOESS ground systems
  - Computational Science
    - Cactus (astrophysics)
  - Engineering
    - Boeing Corp.
  - Other
    - Film making
    - Financial

Community Standards Based on HDF5

- HDF-EOS5
- DOE Defense Labs libsheaf (meshes)
- Nexus (neutron scattering)
- STEP (ISO standard 10303, exchange of manufactured product data)

- … and now netCDF-4

Stakeholders

- Everyone who uses netCDF or HDF5…

Information

- NetCDF-4 Web site:

http://my.unidata.ucar.edu/content/software/netcdf/netcdf-4/index.html

- HDF Web site:
  http://hdf.ncsa.uiuc.edu

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http://hdf.ncsa.uiuc.edu/acknowledge.html